



# M248/Specimen

Module Examination

Analysing data

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Time allowed: 3 hours

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There are **TWO** parts to this examination. Each part carries 50% of the total marks for the examination. You should attempt **ALL** questions in both parts.

Part 1 consists of computer-marked multiple choice questions. You should record your answers to Part 1 **in pencil on the CME form provided**, according to the instructions given on the next page. You may use a supplementary answer book for working out your solutions: this working will **not** be marked.

Part 2 consists of written questions. Your answers for Part 2 should be written **in pen in the spaces provided inside this examination paper**. Throughout Part 2 you should **show all your working**. If you need extra space, you may continue your working in a supplementary answer book. Please write on the front of any supplementary answer book the numbers of the questions you have attempted.

## At the end of the examination

The CME form consists of two parts: make sure that you have completed both parts. Also check that you have written your personal identifier and examination number on each supplementary answer book that you submit. **Failure to do so will mean that your work cannot be identified.**

Attach your signed desk record to the front of the examination paper and any supplementary answer book(s) using the round paper fastener. Then attach the CME form to the back of the examination paper using the flat paperclip. **It is important that the flat paperclip is used with the CME form since the computer cannot read CME forms with punched holes.**

Write your examination number, personal identifier and calculator model below.

Examination No.								
Personal Identifier								
Calculator model								

For Examiner's use only:

Subtotal A		Subtotal B		Part 2 Total	
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## PART 1

- *This part of the paper carries 50% of the total marks.*
- *You should attempt **ALL** the questions in this part of the examination.*
- *You should note that for some of these questions you may be required to select more than one answer from the options given. All such questions include an instruction like ‘You should choose **TWO** options for this question’.*
- *Record your answers **in pencil on the CME form provided** according to the instructions below. (Allow some time to check that your selections have been correctly entered on the CME form.)*

### Instructions for completing the computer-marked examination (CME) form

1. You will find one CME form provided with this paper.
2. You should **use a pencil to make entries on the CME form**. If you make any smudges or other marks on the form that you cannot cancel out clearly, then you should *ask the invigilator for a new form*, and transfer your entries onto the new form.
3. The CME form consists of Part 1 (see point 4 below) and Part 2 (see point 5 below).
4. In Part 1 of the CME form, write your name and personal identifier (not your examination number), and the assignment number for the examination, that is, M248 81.
5. In Part 2 of the CME form, record your answers to Questions 1 to 30.
6. Please note that for each question you should pencil across either the required number of cells or the ‘don’t know’ cell (denoted by a ‘?’).
7. If you think that a question is unsound in any way, pencil across the ‘unsound’ cell (U) *in addition* to pencilling across either an answer cell or the ‘don’t know’ cell.
8. Please note that you will not be allowed extra time at the end of the examination to fill in your CME form.

**Failure to follow the above instructions may mean that we are unable to identify your work and award a mark for Part 1 of the examination.**

### Question 1

A sample of data consists of the following values.

1.01 1.07 1.11 1.11 1.13 1.14 1.26 1.74

Select the TWO options that give the values of (i) the lower quartile, and (ii) the upper quartile. [2]

*Options for Question 1*

*You should choose TWO options for this question*

- A** 1.12      **B** 1.055      **C** 1.08      **D** 1.14  
**E** 1.07      **F** 1.23      **G** 1.1325      **H** 1.11

### Question 2

A sample of data consists of the following values.

21 22 22 24 26 26 26 28 31 32 32  
35 36 38 39 39 40 41 44 56 60

Given that the upper quartile and interquartile range for these data are 39.5 and 13.5, respectively, select the option that gives the upper adjacent value. [2]

*Options for Question 2*

- A** 44      **B** 56      **C** 59  
**D** 59.75      **E** 60      **F** 66.5

### Question 3

Suppose that a sample is drawn on a random variable  $X$  that has the probability density function  $f(x)$  shown in Figure 1.

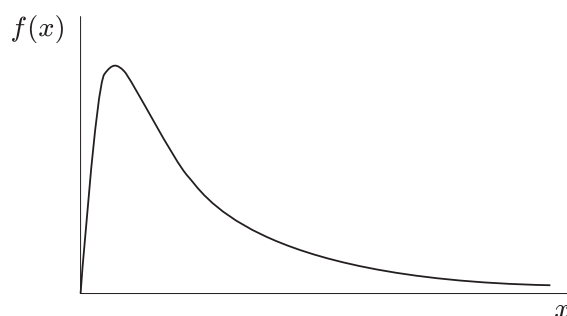


Figure 1

Select the THREE correct statements from the following options.

[3]

*Options for Question 3*

*You should choose THREE options for this question*

- A** The sample mean is likely to be greater than the sample median since the mean is generally greater than the median for right-skew data.
- B** The sample mean is likely to be less than the sample median since the mean is generally less than the median for right-skew data.
- C** The sample mean is likely to be greater than the sample median since the mean is generally greater than the median for left-skew data.
- D** The sample mean is likely to be less than the sample median since the mean is generally less than the median for left-skew data.
- E** The mean is a more suitable measure of location for the sample than the median.
- F** The median is a more suitable measure of location for the sample than the mean.
- G** The standard deviation is a more suitable measure of dispersion for the sample than the interquartile range.
- H** The interquartile range is a more suitable measure of dispersion for the sample than the standard deviation.

### Questions 4, 5, 6 and 7

A factory operates three shifts – Day, Swing and Night. Some of the accidents that occur at the factory can be attributed at least in part to unsafe working conditions; others cannot. The table below shows the numbers of accidents of each type that occurred in each shift during a year.

Numbers of accidents during a year

Shift	Attributable to unsafe conditions		Total
	Yes	No	
Day	20	70	90
Swing	16	40	56
Night	10	44	54
Total	46	154	200

- 4 Choose the option that gives, to two decimal places, the proportion of accidents in the factory that were attributable to unsafe working conditions.

[1]

*Options for Question 4*

- A 0.10      B 0.77      C 0.08  
D 0.05      E 0.23      F 0.30

- 5 Choose the option that gives, to two decimal places, the proportion of accidents that occurred on the night shift.

[1]

*Options for Question 5*

- A 0.27      B 0.45      C 0.19  
D 0.28      E 0.37      F 0.05

- 6 Choose the option that gives an estimate, obtained using the data, of the probability that an accident that occurred on the night shift was due to unsafe working conditions.

[1]

*Options for Question 6*

- A 0.217      B 0.851      C 0.185  
D 0.227      E 0.230      F 0.050

- 7 Choose the option that gives an estimate, obtained using the data, of the probability that an accident that was attributable to unsafe working conditions occurred on the day shift.

[1]

*Options for Question 7*

- A 0.100      B 0.450      C 0.286  
D 0.511      E 0.222      F 0.435

### Questions 8, 9, 10 and 11

Four variables are described below.

- X* The number of wheel bearings, out of four, that are found to be damaged when a car has completed a long test run on a test track
- Y* The length of the right antenna of an aphid measured when aphids are studied by an ecologist
- Z* The number of traffic accidents that occur on a randomly chosen day on a particular stretch of motorway
- U* The waiting time between arrivals of telephone calls at a customer service department

- 8 Choose the option that gives the distribution that would be a reasonable initial probability model for variable *X*. [1]

*Options for Question 8*

- A** Bernoulli      **B** Binomial      **C** Geometric  
**D** Poisson      **E** Exponential      **F** Normal

- 9 Choose the option that gives the distribution that would be a reasonable initial probability model for variable *Y*. [1]

*Options for Question 9*

- A** Bernoulli      **B** Binomial      **C** Geometric  
**D** Poisson      **E** Exponential      **F** Normal

- 10 Choose the option that gives the distribution that would be a reasonable initial probability model for variable *Z*. [1]

*Options for Question 10*

- A** Bernoulli      **B** Binomial      **C** Geometric  
**D** Poisson      **E** Exponential      **F** Normal

- 11 Choose the option that gives the distribution that would be a reasonable initial probability model for variable *U*. [1]

*Options for Question 11*

- A** Bernoulli      **B** Binomial      **C** Geometric  
**D** Poisson      **E** Exponential      **F** Normal

**Question 12**

A discrete random variable  $Y$  has the probability distribution given in the table below.

$y$	0	1	2	3
$p(y)$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$

Choose the option that gives the mean of  $X$ .

[2]

*Options for Question 12*

**A**  $1\frac{1}{2}$       **B**  $\frac{1}{4}$       **C** 1      **D**  $1\frac{3}{4}$       **E**  $1\frac{7}{8}$       **F**  $1\frac{3}{8}$

**Question 13**

A discrete random variable  $X$  has the probability distribution given in the table below.

$x$	-1	0	1
$p(x)$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{2}$

Given that the mean of  $X$  is  $\frac{1}{6}$ , choose the option that gives the variance of  $X$ .

[2]

*Options for Question 13*

**A**  $\frac{1}{9}$       **B**  $\frac{29}{36}$       **C**  $\frac{2}{27}$       **D**  $\frac{5}{6}$       **E**  $\frac{2}{3}$       **F**  $\frac{5}{36}$

**Question 14**

The reliability of an electrical fuse is the probability that a randomly selected fuse will function under the conditions for which it has been designed. The reliability of a particular type of fuse is known to be 0.98. Assume independence from fuse to fuse.

Select the TWO options that give (i) the mean and (ii) the variance of the normal distribution that can be used to calculate the approximate value for the probability of observing 27 or more defective fuses in a random sample of 1000 fuses.

[2]

*Options for Question 14*

*You should choose TWO options for this question*

**A** 0.28      **B** 0.53      **C** 0.54      **D** 19.6  
**E** 20      **F** 26.46      **G** 384.16      **H** 980

### Questions 15, 16, 17 and 18

The arrival of incoming telephone calls at an insurance office during office hours may be modelled by a Poisson process. On average, four calls arrive per hour.

- 15** Choose the option that gives the probability that exactly two calls arrive in an hour. [2]

*Options for Question 15*

- A** 0.147      **B** 0.023      **C** 0.037  
**D** 0.090      **E** 0.271      **F** 0.012

- 16** Choose the option that gives the probability that at least two calls arrive in an hour. [2]

*Options for Question 16*

- A** 0.594      **B** 0.762      **C** 0.323  
**D** 0.927      **E** 0.908      **F** 0.238

- 17** Choose the option that gives the probability that the interval between two successive incoming calls is less than ten minutes. [2]

*Options for Question 17*

- A** 0.105      **B** 0.513      **C** 0.487  
**D** 0.811      **E** 0.999      **F** 0.895

- 18** Choose the option that gives the distribution of the number of calls arriving between 9.00 am and 11.00 am. [2]

*Options for Question 18*

- A**  $M(4)$       **B** Poisson(4)      **C**  $M(2)$   
**D** Poisson(2)      **E**  $M(8)$       **F** Poisson(8)

### Question 19

The random variable  $Z$  has a geometric distribution  $G(0.7)$ . Choose the option that gives the probability  $P(Z < 5)$ . [2]

*Options for Question 19*

- A** 0.0720      **B** 0.1029      **C** 0.2401  
**D** 0.7599      **E** 0.8319      **F** 0.9919



**Question 20**

Bathroom tiles of a certain type are sold in packs of 100. The approximate distribution of the weight (in grams) of a pack of 100 tiles is a normal distribution with mean 9900 grams and standard deviation 50 grams.

Choose the option that gives an approximate value for the proportion of 100-tile packs that weigh more than 10 kilograms. [2]

*Options for Question 20*

- A** 0.0228      **B** 0.4207      **C** 0.1587  
**D** 0.0051      **E** 0.3446      **F** 0.025

**Question 21**

The mean weight of passengers on a certain route of an airline company is 70 kg with a variance of 64 kg. The number of passengers on a typical flight on that route is 100.

Choose the option that gives the approximate probability that on a typical flight on that route, the total weight of passengers will not exceed 7200 kg. [2]

*Options for Question 21*

- A** 0.994      **B** 0.488      **C** 0.006  
**D** 0.512      **E** 0.401      **F** 0.450

**Question 22**

The random variable  $X$  has an exponential distribution with parameter  $\lambda = 2$ .

Select the option that gives the variance of  $W = 4X$ . [2]

*Options for Question 22*

- A** 2      **B** 4      **C**  $\frac{1}{2}$       **D**  $\frac{1}{4}$   
**E** 8      **F**  $\frac{1}{8}$       **G** 16      **H** 1

**Question 23**

The independent random variables  $X$  and  $Y$  have chi-squared distributions with 5 and 3 degrees of freedom, respectively.

Select the option that gives the standard deviation of  $U = X - Y$ . [2]

*Options for Question 23*

- A** 2      **B** 4      **C**  $\sqrt{2}$       **D** 9  
**E** 8      **F**  $2\sqrt{2}$       **G** 16      **H** 32

**Question 24**

In a study of pregnancy and childbirth, the birth weight of each of a random sample of 53 newborn babies was recorded. Based on these data, a 95% confidence interval for the mean birth weight of babies was found to be (6.87, 7.45) pounds. You may assume that 1 pound is equivalent to 454 grams.

Choose the option that gives the corresponding 95% confidence interval for the mean birth weight in grams.

[2]

*Options for Question 24*

- |                             |                                   |
|-----------------------------|-----------------------------------|
| <b>A</b> (6.87, 7.45)       | <b>B</b> (3118.98, 3382.30)       |
| <b>C</b> (0.0151, 0.0164)   | <b>D</b> (58.85, 63.82)           |
| <b>E</b> (428.425, 464.595) | <b>F</b> (165 305.94, 179 261.90) |

**Question 25**

In a large maternity hospital, records are kept of the number of babies born with a particular malformation. Assume that births are independent and that the probability of the malformation is the same for all births. Out of 3000 successive live births, six babies had the malformation.

Choose the option that gives the upper limit of an approximate 95% confidence interval for the proportion of babies born with the malformation.

[2]

*Options for Question 25*

- |                 |                 |                 |
|-----------------|-----------------|-----------------|
| <b>A</b> 0.0033 | <b>B</b> 0.0041 | <b>C</b> 0.0039 |
| <b>D</b> 0.0020 | <b>E</b> 0.0036 | <b>F</b> 0.0070 |

**Question 26**

A random sample of fifteen observations is collected on a normally distributed random variable  $X$ . The sample mean is 12.5, and the sample standard deviation is 4.4.

Choose the option that gives the lower limit of an exact 90% confidence interval for  $\mu$ , the underlying population mean.

[2]

*Options for Question 26*

- |               |              |               |
|---------------|--------------|---------------|
| <b>A</b> 11.0 | <b>B</b> 8.2 | <b>C</b> 10.5 |
| <b>D</b> 10.1 | <b>E</b> 9.5 | <b>F</b> 14.5 |

**Question 27**

A researcher is planning an experiment to test the null hypothesis that cakes produced by a new patented industrial process have the same volume as those produced by the company's existing process. Long experience of the existing process has shown that the mean volume of cakes produced by the existing process is 88 standard units, with a standard deviation of 5 standard units. The researcher is prepared to assume that the volumes of cakes produced by the new process will have a normal distribution with the same standard deviation as before, so  $\sigma = 5$ . The data will be analysed using a two-sided test with significance level 5%. The experiment is to have power 80% of finding a difference  $d$  in mean volume of 2 units.

Choose the option that gives the number of cakes that should be measured.

[2]

*Options for Question 27*

- A** 50      **B** 49      **C** 39  
**D** 84      **E** 8      **F** 20

**Question 28**

A linear regression model is to be fitted to data. The following summary statistics are calculated:

$$n = 8, \quad \sum x_i = 26, \quad \sum y_i = 180, \\ \sum x_i^2 = 127, \quad \sum y_i^2 = 4347, \quad \sum x_i y_i = 598.$$

Choose the TWO options that give (i)  $S_{xx}$  and (ii)  $S_{xy}$ .

[2]

*Options for Question 28*

*You should choose TWO options for this question*

- A** 660.13      **B** 297      **C** 4605.25      **D** 62.5  
**E** 4331.13      **F** 13      **G** 549      **H** 42.5

**Question 29**

A linear regression model is to be fitted to data. The following summary statistics are calculated:

$$\bar{x} = 15, \quad \bar{y} = 11, \quad S_{xx} = 452, \quad S_{yy} = 187, \quad S_{xy} = 284.$$

Choose the option that gives the least squares estimate of the slope of the fitted regression line.

[1]

*Options for Question 29*

- A** 1.58      **B** 1.59      **C** -12.88  
**D** 1.52      **E** 0.63      **F** 0.41

## PART 2

- *This part of the paper carries 50% of the total marks.*
- *You should attempt **ALL** the questions in this part of the examination.*
- *Throughout Part 2 you should **show all your working**.*
- *Throughout Part 2 you should write your answer **in pen in the space provided** below each question.*

### Question 30

Give two advantages that boxplots possess for the graphical summary of data, as compared with histograms.

[2]

### Question 31

The two histograms in Figure 2 represent the same data set, namely 63 measurements of annual snowfall (in inches) at Buffalo, New York, USA. Why do the two histograms differ?

[1]

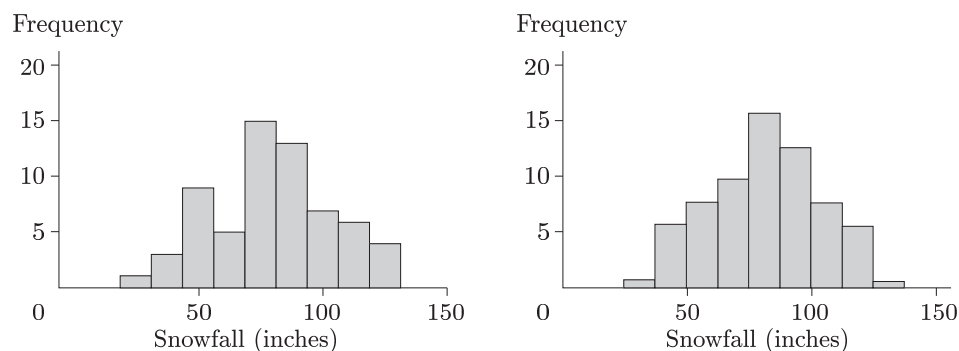


Figure 2

**Question 32**

Explain why the following function is not a valid probability mass function:

$$p(x) = \frac{1}{5}(4 - x), \quad x = 1, 2, 3, 4, 5. \quad [1]$$

**Question 33**

A random sample of 529 men were questioned as part of a survey of drinking habits. In the survey, each man stated the number of units of alcoholic drinks that he consumed in the previous week. Based on these data, the mean number of units consumed by men in the previous week was 18.2, with 90% confidence interval (15.7, 20.7).

- (a) Interpret this confidence interval in terms of repeated experiments. [1]

- (b) Interpret this confidence interval in terms of plausible ranges. [2]

### Question 34

In a study, a researcher calculated that a 95% confidence interval for the population mean  $\mu$  (based on a  $t$ -distribution) was (2.58, 2.98).

- (a) What would be the result of a fixed-level hypothesis test (based on the same  $t$ -distribution) with hypotheses  $H_0: \mu = 3$ ,  $H_1: \mu \neq 3$ , using a 5% significance level? [2]

- (b) Another researcher studied the same data and claimed that the  $p$  value for a significance test (based on the same  $t$ -distribution) with the same hypotheses as in part (a) was 0.15. Why must the result of (at least) one of the researchers be in error? [1]

### Question 35

A sample of size 20 was drawn from population A and a sample of size 30 was drawn from population B. The comparative boxplots in Figure 3 represent the data in the two samples.

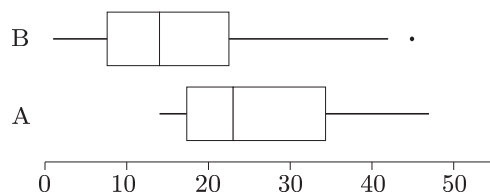


Figure 3

(a) Are the samples right-skew or left-skew? [1]

(b) In one or two sentences, compare the distributions of values in the two samples. [2]

(c) Why would it be inappropriate to use a two-sample  $t$ -test with these data? [1]

(d) A (two-sided) Mann–Whitney test is carried out using these data.

(i) State the null hypothesis of this test. [1]

(ii) The value of the test statistic is  $u_A = 646$ . Find an approximate value for the  $p$  value of the test. [3]

(iii) What can you conclude from this test? [2]



**Question 36**

The data in the table below are measurements on two (non-matched) samples of patients in a clinical trial to compare two drugs, A and B.

Drug A	3.2	0.7	1.0	2.3	2.4
Drug B	1.4	2.6	5.4	4.5	1.7

The sample means are  $\bar{x}_A = 1.92$ ,  $\bar{x}_B = 3.12$ , and the pooled estimate of the common population variance is  $s_P^2 = 2.09$ . Carry out a two-sided  $t$ -test of the null hypothesis that the two drugs produce the same mean effects.

[5]

For Examiner's use only:

Question no.	30	31	32	33	34	35	36	Subtotal A
Mark								

### Question 37

The statements listed in the table below are to be included in a statistical report. For each statement, name the section of the report in which it should feature (A: *Introduction*, B: *Methods*, C: *Results* or D: *Discussion*). Write your answers in the table.

[3]

	Statement	Section
1	Of 567 cars involved in a crash, 85 were red.	
2	The proportion of cars involved in a crash that were red was compared to the proportion of cars known to be on the road that are red using a chi-squared goodness-of-fit test.	
3	The significance probability for the chi-squared goodness-of-fit test was 0.243.	
4	The results were analysed using Minitab Version 16.	
5	The aim of the study was to investigate the effect of a car's colour on the risk of being involved in an accident.	
6	We conclude that red cars are no more likely to be involved in a crash than are cars of other colours.	

**Question 38**

The following random sample of size four was drawn from a population with the continuous uniform distribution  $U(0, \theta)$ , where  $\theta$  is an unknown parameter.

1.43   8.29   2.30   4.07

(a) Write down the maximum likelihood estimate of  $\theta$ . [1]

(b) Explain why, in practice, an alternative estimator for the parameter  $\theta$  is often used. [1]

**Question 39**

The following sample of size three was drawn from a population that has a geometric distribution with unknown parameter  $p$ .

3   1   9

Write down the likelihood of  $p$  for this sample, and simplify your expression. [3]

### Question 40

Figure 4 represents data on the net disposable income in thousands of euros per head of population ( $x$ ) and the number of television sets per 1000 people ( $y$ ) for eleven countries of western Europe.

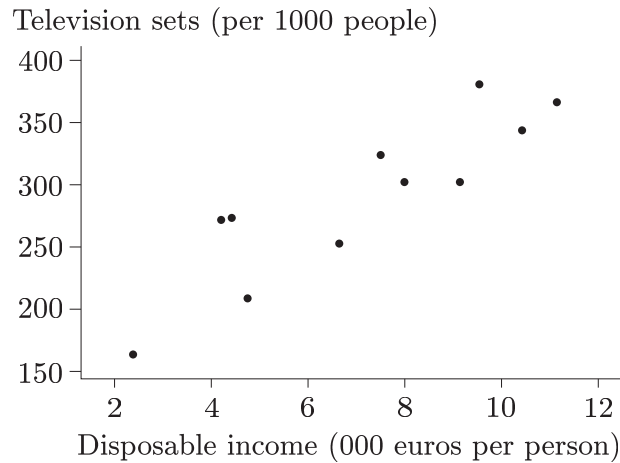


Figure 4

A linear regression model is used to model the relationship between the two variables. The equation of the least squares line for these data is

$$y = 133.56 + 21.65x.$$

- (a) According to the fitted model, what would be the effect on the number of television sets per 1000 people of increasing a country's net disposable income by 1000 euros?

[1]

- (b) For these data,  $S_{xx} = \sum(x_i - \bar{x})^2 = 82.01$  and  $s^2 = 1072.0$ . Obtain a 95% confidence interval for the slope parameter  $\beta$  of the regression line.

[4]

**Question 41**

When fitting a linear regression model, what plots would you obtain in order to check that the assumptions of the linear regression model are satisfied? Say what you would look for in each plot.

[3]

**Question 42**

- (a) Draw a rough scatterplot to illustrate a sample of data with two variables for which the Spearman correlation is 1 but the Pearson correlation is less than 1.

[1]

- (b) If the Pearson correlation is 1, must the Spearman correlation also be 1? Explain your answer.

[1]

### Question 43

Thirty passengers on a flight from Los Angeles to London took part in an experiment to investigate whether a new drug suppresses jet lag. The subjects were divided into two groups; one was given the course of treatment, and the other was given a placebo (an inactive substance). The data from the experiment are in the following table.

Results of an experiment

	Jet lag	No jet lag	Row total
Treatment group	3	12	15
Placebo group	10	5	15
Column total	13	17	30

A chi-squared test is to be used with the data in the table to investigate whether the treatment suppressed jet lag.

(a) State the null hypothesis of the test. [1]

(b) Calculate the expected frequency for each cell, and hence find the value of the test statistic. [2]

(c) What can you say about the  $p$  value for these data? [2]

(d) Report your conclusions. [2]

For Examiner's use only:

Question no.	37	38	39	40	41	42	43	Subtotal B
Mark								

[END OF QUESTION PAPER]





# COMPUTER MARKED EXAMINATION FORM

08/20

## PART 1

PERSONAL IDENTIFIER  
(NOT Examination Number)

ASSIGNMENT NUMBER  
(as given on the question paper)

NAME and INITIALS

### IMPORTANT NOTES

1. Please check that all of this form has been completed including the coloured boxes in Part 1 with your Personal Identifier, Module and Assignment Number.
2. Only use an HB pencil to complete this form and press firmly.
3. Shown opposite are examples of the correct marks to use. Do not use any other types of mark.

**PLEASE DO NOT PUNCH HOLES  
IN THIS FORM**

For this form, OMR/UBS, along the perforation

PERSONAL IDENTIFIER									
A	0	0	0	0	0	0	0	0	0
B	1	1	1	1	1	1	1	1	1
C	2	2	2	2	2	2	2	2	2
D	3	3	3	3	3	3	3	3	3
E	4	4	4	4	4	4	4	4	4
F	5	5	5	5	5	5	5	5	5
G	6	6	6	6	6	6	6	6	6
H	7	7	7	7	7	7	7	7	7
K	8	8	8	8	8	8	8	8	8
L	9	9	9	9	9	9	9	9	9
M									X
N									
P									
R									
S									
T									
U									
V									
W									
X									
Y									

**CORRECT MARK**

Pencil across between dots

**CANCELLATION MARK**

To cancel a mark pencil in the coloured part of the cell. Do not rub out

MODULE AND ASSIGNMENT NUMBER										OFFICE USE ONLY	
A	A	A	A	0	0	0	0	0	0	0	0
B	B	B	B	1	1	1	1	1	1	1	1
C	C	C	C	2	2	2	2	2	2	2	2
D	D	D	D	3	3	3	3	3	3	3	3
E	E	E	E	4	4	4	4	4	4	4	4
F	F	F	F	5	5	5	5	5	5	5	5
G	G	G	G	6	6	6	6	6	6	6	6
H	H	H	H	7	7	7	7	7	7	7	7
K	K	K	K	8	8	8	8	8	8	8	8
L	L	L	L	9	9	9	9	9	9	9	9
M	M	M	M								
N	N	N	N								
P	P	P	P								
R	R	R	R								
S	S	S	S								
T	T	T	T								
U	U	U	U								
W	W	W	W								
X	X	X	X								
Y	Y	Y	Y								
Z	Z	Z	Z								

**OFFICE USE ONLY**



The Open University

## PART 2

ANSWER										ANSWER										ANSWER									
1	A	B	C	D	E	F	G	H	? U	21	A	B	C	D	E	F	G	H	? U	41	A	B	C	D	E	F	G	H	? U
2	A	B	C	D	E	F	G	H	? U	22	A	B	C	D	E	F	G	H	? U	42	A	B	C	D	E	F	G	H	? U
3	A	B	C	D	E	F	G	H	? U	23	A	B	C	D	E	F	G	H	? U	43	A	B	C	D	E	F	G	H	? U
4	A	B	C	D	E	F	G	H	? U	24	A	B	C	D	E	F	G	H	? U	44	A	B	C	D	E	F	G	H	? U
5	A	B	C	D	E	F	G	H	? U	25	A	B	C	D	E	F	G	H	? U	45	A	B	C	D	E	F	G	H	? U
6	A	B	C	D	E	F	G	H	? U	26	A	B	C	D	E	F	G	H	? U	46	A	B	C	D	E	F	G	H	? U
7	A	B	C	D	E	F	G	H	? U	27	A	B	C	D	E	F	G	H	? U	47	A	B	C	D	E	F	G	H	? U
8	A	B	C	D	E	F	G	H	? U	28	A	B	C	D	E	F	G	H	? U	48	A	B	C	D	E	F	G	H	? U
9	A	B	C	D	E	F	G	H	? U	29	A	B	C	D	E	F	G	H	? U	49	A	B	C	D	E	F	G	H	? U
10	A	B	C	D	E	F	G	H	? U	30	A	B	C	D	E	F	G	H	? U	50	A	B	C	D	E	F	G	H	? U
11	A	B	C	D	E	F	G	H	? U	31	A	B	C	D	E	F	G	H	? U	51	A	B	C	D	E	F	G	H	? U
12	A	B	C	D	E	F	G	H	? U	32	A	B	C	D	E	F	G	H	? U	52	A	B	C	D	E	F	G	H	? U
13	A	B	C	D	E	F	G	H	? U	33	A	B	C	D	E	F	G	H	? U	53	A	B	C	D	E	F	G	H	? U
14	A	B	C	D	E	F	G	H	? U	34	A	B	C	D	E	F	G	H	? U	54	A	B	C	D	E	F	G	H	? U
15	A	B	C	D	E	F	G	H	? U	35	A	B	C	D	E	F	G	H	? U	55	A	B	C	D	E	F	G	H	? U
16	A	B	C	D	E	F	G	H	? U	36	A	B	C	D	E	F	G	H	? U	56	A	B	C	D	E	F	G	H	? U
17	A	B	C	D	E	F	G	H	? U	37	A	B	C	D	E	F	G	H	? U	57	A	B	C	D	E	F	G	H	? U
18	A	B	C	D	E	F	G	H	? U	38	A	B	C	D	E	F	G	H	? U	58	A	B	C	D	E	F	G	H	? U
19	A	B	C	D	E	F	G	H	? U	39	A	B	C	D	E	F	G	H	? U	59	A	B	C	D	E	F	G	H	? U
20	A	B	C	D	E	F	G	H	? U	40	A	B	C	D	E	F	G	H	? U	60	A	B	C	D	E	F	G	H	? U